2.0 Description of the Proposed Action – Use of Renovate®

The proposed action is the use of the aquatic herbicide Renovate® for the control of nuisance aquatic vegetation in waterbodies located in the State of New York.

2.1 General Description of the Aquatic Herbicide Triclopyr (Renovate®)

Renovate® 3 is classified in New York State as a restricted use herbicide product labeled for control of floating, submerged or emergent aquatic plants in and around aquatic settings such as ponds, lakes, reservoirs, non-irrigation canals, ditches, marshes and wetlands.

Renovate® 3 is composed of 44.4% active ingredient, triclopyr (3,5,6-trichloro-2-pyridinyloxyaceticacid) triethylamine (TEA) salt, and 55.6% "inert" ingredients. "Inert" ingredients listed on the herbicide material safety data sheet (MSDS) (see Appendix A) include ethanol and triethylamine. Water also composes a portion of the "inert" ingredients. Renovate® 3 is currently packaged as a liquid, but a flake formulation will be introduced in the future (see discussion below regarding Renovate OTF- formulation).

2.1.1 Purpose of the Product

Renovate® is a relatively fast-acting, systemic, selective herbicide proposed for the control of certain submersed, floating, and emergent aquatic plant species, including woody plants, in ponds, lakes, and reservoirs. Additional treatment sites include adjacent banks, shores, canal banks and on non-irrigation canals which have little or no continuous outflow, marshes and wetlands.

Triclopyr is a systematic herbicide with selective control of woody and broadleaf species. While the parent molecule of triclopyr is an acid, it is formulated in Renovate® as an amine/salt derivative. Generally, salts, esters or amines are formulated to enhance absorption by the plant leaf or increase herbicide solubility. The parent acid portion of the formulation is the active portion, binding to the herbicide target site within the plant leading to plant death (Antunes-Kenyon and Kennedy, 2004).

When applied, triclopyr rapidly enters through a plant's leaves and stems, then translocates down into the roots, disrupting the plant's metabolism. Foliar applications are most effective when applied when plants are actively growing from spring to early summer. Triclopyr is very useful for controlling dicots like Eurasian watermilfoil and purple loosestrife. Native grasses and sedges (monocots) are generally unaffected by triclopyr, increasing the selectivity of the herbicide.

2.1.2 Need for the Product

The use of Renovate® 3 or OTF can be an important component of a comprehensive and integrated plant management approach to limit the spread of certain aquatic macrophytes. These macrophytes can be undesirable in certain circumstances. They may be introduced non-indigenous (i.e., exotic) species, which because of the lack of natural controlling ecological factors reach a nuisance stage in terms of extreme numbers or biomass. Such exponential growth can significantly reduce the recreational use of a waterbody by interfering with swimming, boating, or fishing. They may also clog intake screens and turbines, impart an unpleasant taste to the water, and reduce the presence of native aquatic species (Madsen et al., 1991a). Vermont Department of Environmental Conservation notes that nuisance vegetation may modify the aquatic habitat for indigenous organisms (VDEC, 1993).

Because of its capability of forming beds of high biomass reaching into the water column, excessive growth of the invasive exotic species Eurasian watermilfoil (i.e., *Myriophyllum spicatum*; a primary target species for Renovate®) may also present a safety hazard to the recreational use of a waterbody. These dense beds

reaching to the surface may obscure or cover rocks, logs, and other obstructions that could damage moving boats or injure water skiers. Additionally, the beds may entangle swimmers, potentially resulting in injury or death. Drownings as a result of entanglement in Eurasian watermilfoil mats have been documented in New York (Long et al., 1987) and Michigan (COLAM, 1992).

New York has abundant lakes and ponds located throughout the Empire State and they represent a significant ecological, cultural and recreational resource. For example, NYSDEC (1987) reports that over 7,500 lakes, ponds, and reservoirs can be found in New York. A large number of New York lakes are currently impacted with aquatic weeds as documented on NYS Priority Waterbody List (NYSDEC, 2005). Many of these lakes suffer impairment due to the presence of exotic invasive species. Eurasian watermilfoil is considered the most invasive submergent aquatic plant throughout New York (NYSDEC, 2005).

Triclopyr is particularly valuable as an active ingredient because the primary competing active ingredients for use in controlling submersed, emersed and floating invasive plants can not be used over the range of encountered conditions. It also has some advantages over other NYS-registered aquatic herbicides commonly used to control Eurasian watermilfoil. Fluridone requires an extended contact time with elevated water concentrations of weeks to months, while effective triclopyr exposures can be less than a few days and allow for localized management of Eurasian watermilfoil. Endothall is a contact herbicide and is not selective for Eurasian watermilfoil (i.e., impacts native pondweed species). Similar to diquat, in New York State 2,4-D cannot be applied beyond 200 feet from shore or in water depths greater than six feet (whichever provides the greater distance from shore). Although glyphosate is an effective floating and emergent product, it does not provide the selective properties required for many invasive weed management programs in aquatic sites (i.e., to control purple loosestrife, *Phragmites*). Additional information is provided in Section 7.7.4.

2.1.3 Benefits of the Product

Renovate® provides an alternative means for management and/or control of common invasive exotic species, particularly Eurasian watermilfoil and purple loosestrife (*Lythrum salicaria*), with little or no impact to native aquatic plants, such as cattails, rushes, reeds, grasses, and submerged monocots (Petty et al., 2003). Therefore, Renovate® can be used selectively to restore wetlands and for aquatic ecosystem management. Specific target macrophyte species are presented in Section 2.4 and in Table 2-1.

The recent registration of Renovate® 3 (and pending registration for Renovate® OTF) will provide an additional macrophyte control treatment to the existing arsenal of tools and techniques already used to manage lakes with excessive macrophyte biomass (see Section 7.0 for discussion of alternatives).

2.1.4 History of the Product Use

Triclopyr was first registered by USEPA in 1979 and has been used since the 1970s for control of broadleaf weeds and wood plants on rights-of-way (ROWs), rangeland, industrial sites, and other non-crop areas (Antunes-Kenyon and Kennedy, 2004). Most applications for these purposes have used the pesticide product Garlon® 3 or 3A as manufactured by Dow AgroSciences, LLC. The triclopyr TEA formulation in Garlon® 3A has been approved by NYSDEC for these types of applications in terrestrial settings.

Between 1984 and 2002, the active ingredient triclopyr was used under an Experimental Use Permit (EUP) as an aquatic herbicide for small test plots around the country. In 2002, the USEPA master Federal label (approved on December 2, 2002 for Garlon® 3) listed additional use directions for applications at aquatic sites. Accordingly, a dedicated product for aquatic settings, designated Renovate® 3 was approved in December 2002 [note: Renovate is a registered trademark of Dow AgroSciences LLC]. The USEPA registration number for Renovate® 3 is 62719-37-67690. Renovate® 3 is the first aquatic herbicide to be federally registered since 1988.

Renovate® 3 is registered for use without restrictions beyond those on the Federal label in all states bordering New York. The State of Massachusetts recently approved (November 2004) the use of this aquatic herbicide (see review for Massachusetts application in Antunes-Kenyon and Kennedy, 2004). While Renovate® 3 is not presently registered in Canada, triclopyr was recently re-evaluated by Health Canada Pest Management Regulatory Agency (PMRA) who determined that the chemical was acceptable for potential registration providing that proposed mitigative measures were adopted (PMRA, 2004).

On October 23, 2006, SePRO received Renovate® Granular registration from USEPA and this document is contained in Appendix A. SePRO is currently pursuing state registrations (including a Supplemental 24(c) label for New York) for the alternate brand, Renovate® OTF. Renovate OTF is composed of 10% acid equivalent, triclopyr TEA salt, and 86.0% "inert" ingredients (see Appendix A for MSDS sheet and Section 4.0 for chemical properties). Renovate OTF is a dry flake formulation and is labeled for control of emersed, submersed and floating aquatic plants in the following aquatic sites: ponds; lakes; reservoirs; marshes; wetlands; impounded rivers, streams and other bodies of water that are quiescent; non-irrigation canals, seasonal irrigation waters and ditches which have little or no continuous outflow. The use of a dry flake carrier for triclopyr will improve control and cost-effectiveness of Eurasian watermilfoil and other susceptible weeds in shoreline treatments, spot treatments and in deeper water areas that are more susceptible to dilution.

2.2 General Location of the Proposed Action

For the purposes of this portion of the SEIS, the general location for the proposed action is in the surface waters of the State of New York. The proposed action is the use of the aquatic herbicide Renovate® 3 for the control of certain nuisance aquatic macrophytes. Renovate® 3 is currently seeking registration in New York for use in freshwater ponds, lakes, reservoirs, non-irrigation canals and ditches with little or no continuous outflow, marshes and wetlands. Under Article 24 of the Environmental Conservation Law, some ponded water may be described as wetlands. A specific description of the actual body of water in which Renovate® 3 is intended for use would be included in the individual permit applications. This would also include any applications in New York State-designated wetland areas. Further descriptions of New York lakes and wetlands and their characteristics are given in Section 3.0.

2.3 Support of Designated Uses

All New York State surface waters are classified under 6 NYCRR Part 701.2 – 701.9, which delineates the protected or so-called designated uses inherent to such classifications. These designated uses for fresh waters include: source of water supply for drinking; culinary or food processing purposes; primary and secondary contact recreation; and fishing. In addition, the waters shall be suitable for fish propagation and survival.

To protect these uses, New York has promulgated water quality standards (6 NYCRR Part 703) to support the best uses of the waters. These standards include several types including those pertaining to human health (water source and fish consumption), aquatic life (survival and propagation), wildlife (protection of piscivores) and aesthetic qualities. The latter is defined in a narrative water quality standard (6 NYCRR Part 703.2) that provides a general condition for all taste, color, and toxic and other deleterious substances shall not be in amounts "that will adversely affect the taste, color or odor thereof, or impair the waters for their best usages."

Presently there are no chemical-specific New York State water quality standards for triclopyr or its salts (e.g., Renovate®) in effect. However, for purposes of the SEIS, information will be provided to show how proper use of the aquatic herbicide Renovate® 3 or OTF for the control of nuisance aquatic vegetation will not adversely affect any of the protected or best uses of the treated waterbody. In addition, there can be secondary economic benefits by control of nuisance aquatic vegetation (Mongin, 2005).

Protection of human health concerns (drinking water, fish consumption, primary and secondary recreation) are considered in Section 6.0; considerations for potential ecological impacts (aquatic life support function, wildlife) are considered in Sections 5.0 and 9.0; and aesthetics in Section 7.0.

2.4 Potential Aquatic Macrophyte Target Species

Based on the registered label for Renovate® 3, the aquatic macrophyte species listed in Table 2-1 are considered to be potential target species for this product. However, not all of the aquatic macrophyte species described on the product label are typically found in the State of New York. Table 2-1 indicates which species are listed on the federally registered Renovate® 3 label, but do not occur in New York State. The detailed discussions of the primary target species below refer to species common to much of New York State.

2.4.1 Eurasian Watermilfoil

A primary target species for Renovate® in New York State is Eurasian watermilfoil (*M. spicatum*). Eurasian watermilfoil is considered the most invasive submergent aquatic plant throughout New York State (NYSDEC, 2005). Eurasian watermilfoil is an aquatic plant found in the taxonomic family Haloragaceae. It is a rooted, vascular submergent macrophyte with long stems and feathery perennial leaves. Plants form no specialized overwintering vegetative structures such as turions. Eurasian watermilfoil is an invasive, opportunistic exotic plant that is native to Europe, Asia, and North Africa (Reed, 1977; Pullman, 1993; and Long et al., 1987). Hotchkiss (1972) reports that Eurasian watermilfoil is distributed across the northern tier of the United States, from California to Vermont. Additional information regarding the distribution, life history, and ecology of this species is given in Section 3.4.1.

2.4.2 Purple Loosestrife

Another primary target species for Renovate® in New York State is purple loosestrife (*L. salicaria*). Purple loosestrife is an herbaceous, wetland perennial of European origin. Main leaves are 3 to 10 cm long and can be arranged opposite or alternate along the squared stem and are either glabrous or pubescent. Inflorescence is a spike of clusters of reddish-purple petals (10 to 15 mm in length). Flowers are tri-morphic with short, medium, and long petals and stamens (USDA, 2002). Additional information regarding the distribution, life history, and ecology of this species is given in Section 3.4.2.

2.4.3 Other Potential Aquatic Macrophyte Target Species

The following species are listed on the federal label for Renovate® 3 as potential species targeted for control. Only those potential target species actually occurring in New York State are discussed in this section.

- American frogbit (*Limnobium spongia*) – American frogbit is a native aquatic monocot found in marshes or slow flowing waters. Although it is a native plant, it may produce extensive floating mats and create nuisance situations (Madsen, et al., 1998).
- American lotus (*Nelumbo lutea*) - The American lotus or yellow lotus is found in the taxonomic family Nymphaeaceae. The lotus is characterized by grayish-green leaves which are as much as 2 feet across and float or stand above the water.
- Parrotfeather (*Myriophyllum aquaticum*) – Parrotfeather is an easily recognized member of the milfoil family because its stiff, bright green leaves rise above the water like a forest of tiny fir trees. These emergent leaves have a feather-like shape and are arranged in whorls around the stiff stem. Introduced from South America, parrotfeather has become a nuisance in many parts of the world, often creating dense mats on the surface of shallow water or on wet soil (Hamel and Parsons, 2001).
- Pennywort (*Hydrocotyle ranunculoides*) – Pennywort is a perennial, aquatic plant, with floating and emergent leaves and is protected in New York State. The most visible feature of water pennywort is the dark green, deeply-lobed, round leaves rising above the water surface. The plants are smooth and

somewhat fleshy, with long creeping stems that often float near the waters surface. The small clusters of flowers occur on stalks attached to the horizontal stems. Water pennywort can form a dense mat of leaves along the edges of lakes and ponds and often remains green in winter (Hamel and Parsons, 2001).

- Pickerelweed (*Pontederia cordata*) – Pickerelweed is a very common emergent plant that can be a very prolific grower and may cover large areas. Pickerelweed is found most commonly in shallow, quiet, streams, lakes, and rivers.
- Spatterdock (*Nuphar spp*.) - Spatterdock (Family Nymphaeaceae) is found in inland and coastal fresh water marshes, ponds, lakes, pools, and the borders of slowly moving streams. Leaves vary greatly in size, but are generally large and lance-like in shape. In the form of the species indigenous to the northeastern United States, the leaves generally float on the surface of the water (Hotchkiss, 1972).
- Water hyacinth (*Eichhornia crassipes*) – Water hyacinth is an erect, free-floating, stoloniferous, perennial herb. The buoyant leaves vary in size and morphology. The short, bulbous leaf petioles produced in uncrowded conditions provide a stable platform for vertical growth. Water hyacinth grows best in neutral pH, water high in macronutrients, warm temperatures (28° to 30°C), and high light intensities (USDA, 2002)
- Waterlily (*Nymphaea spp.*) - Waterlilies (Family Nymphaeaceae) are aquatic herbs with thick cylindric, horizontal rootstocks. The leaves are generally large and cordate. Flowers are showy (Britton and Brown, 1970). Waterlilies are found in slow, standing water in ponds, lakes or slowly moving streams. The three species of waterlily commonly found in New York State include *Nymphaea odorata, N. tuberosa*, and *N. alba*.
- Watermilfoil (*Myriophyllum spp.*) - Native species of Myriophyllum (Family Haloragaceae) are submersed, stout-stemmed perennials (Fairbrothers and Moul, 1965). There are generally 5 to 13 pairs of leaflets per leaf with each leaf approximately 4 cm long. Flowers are small and inconspicuous and occur in the axils of the upper leaves Watermilfoil is found in ponds, lakes, sluggish streams, and shorelines. Three species of watermilfoil (*M. alterniflorum, M. farwellii, M. pinnatum*) are listed as protected plants in New York State (Young, 2004).
- Water primose (*Ludwigia spp.*) – Water primroses are found in the evening-primose family (Onagraceae). Plants in the genus *Ludwigia* are perennial or annual herbs, with alternate, usually entire leaves. They are generally found in freshwater marshes (Britton and Brown, 1970). *Ludwigia* (*Ludwigia sphaerocaqa*) is listed as a rare plant species in NYS.

Table 2-1 Aquatic Macrophytes Controlled by Renovate® as indicated by Federal labeling.

alligatorweed [2]	milfoil species	purple loosestrife
American lotus	spatterdock	water hyacinth
American frogbit	parrotfeather [1]	waterlily
aquatic soda apple [2]	pickerelweed	waterprimose
Eurasian watermilfoil	pennywort	

1 -- Retreatment may be needed to achieve desired level of control.

2 – Species not found in the State of New York

List of aquatic weeds obtained from Renovate® 3 label presented in Appendix A.